

## APPARENT VERSUS REAL FAUNAL TURNOVER IN THE LATE PLIOCENE VERTEBRATE RECORD OF AFRICA

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A major turnover event between 3 and 2 Ma has been proposed for the African mammalian record, with implications for the evolution of hominids including the genus *Homo*. This event is thought to be coordinated with global climate change and is used in support of the "turnover pulse" hypothesis of E. Vrba. We examined the evidence for this event using the Evolution of Terrestrial Ecosystems database, which currently includes records of 510 taxa from 504 localities for African mammals between 0-6 Ma. Raw data consist of locality, age, taxon, paleoenvironmental and taphonomic information, which were then analyzed to show the effects of various biases on mammalian faunal ranges for the 3-2 Ma interval. We examined two factors that have important effects on apparent versus real species appearances and disappearances: fossil productivity and taxonomy. The Turkana Basin in northern Kenya has the best-studied and best-dated record for this interval, and it includes three neighboring but distinct regions (East Turkana, West Turkana, and Omo) that can be examined separately for evidence of the effects of differential fossil productivity. One analysis of the data works with "minimum numbers of species" (e.g., combines species and cf. species of the same name or eliminates taxa that cannot be identified as unique) and includes only taxa that occur in more than one of the regions; this approach minimizes the effects of differences in taxonomy and fossil productivity in the three regions. A contrasting analysis considers all named species and genera as separate entities and includes data from all regions, this maximizes the number of apparent turnover events. Of the total recorded species that occur between 2-3 Ma, first and last occurrences vary from 38% (most conservative data set) to 51% (least conservative data set). East Turkana is the only region that has high apparent turnover at about 2.5 Ma (54%), and this can be attributed primarily to a marked change in fossil productivity. The conservative interpretation of species ranges for the basin as a whole indicates that there is turnover of 35-40% of the mammalian species between 3 and 2 Ma, mostly consisting of species appearances. Over 60% of the species continue through the interval, indicating a dominant pattern of stability with some turnover spread out over a million years. There is no evidence of a "major" turnover pulse in the Turkana Basin between 2 and 3 Ma. Since this sequence is used to calibrate late Pliocene faunal change in other parts of Africa, the existence of a pan-African turnover event between 2 and 3 Ma must also be questioned. Our study shows that even one of the best-documented vertebrate records must be subjected to rigorous quality control in order to reveal the extent of "real" species turnover.